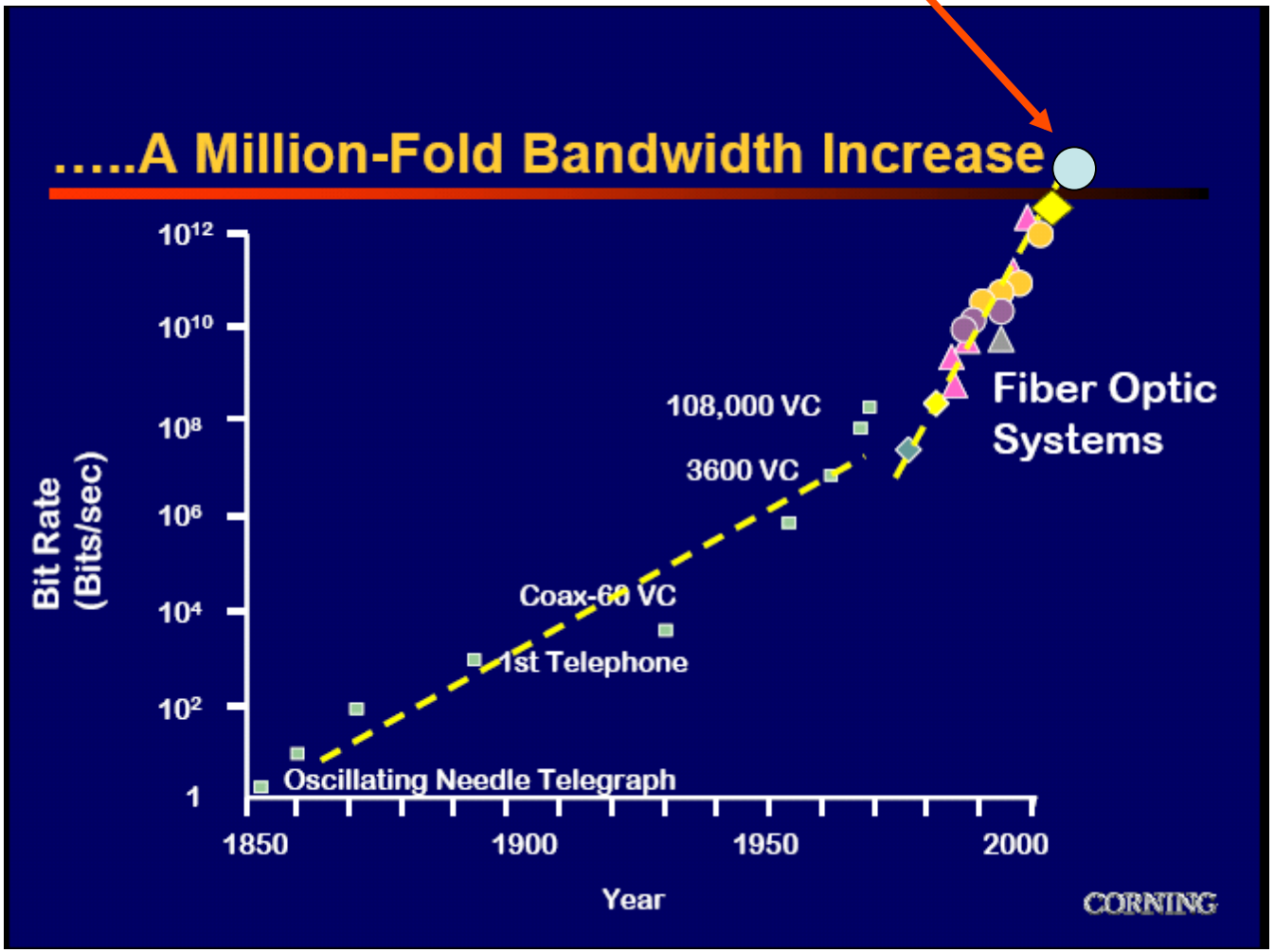
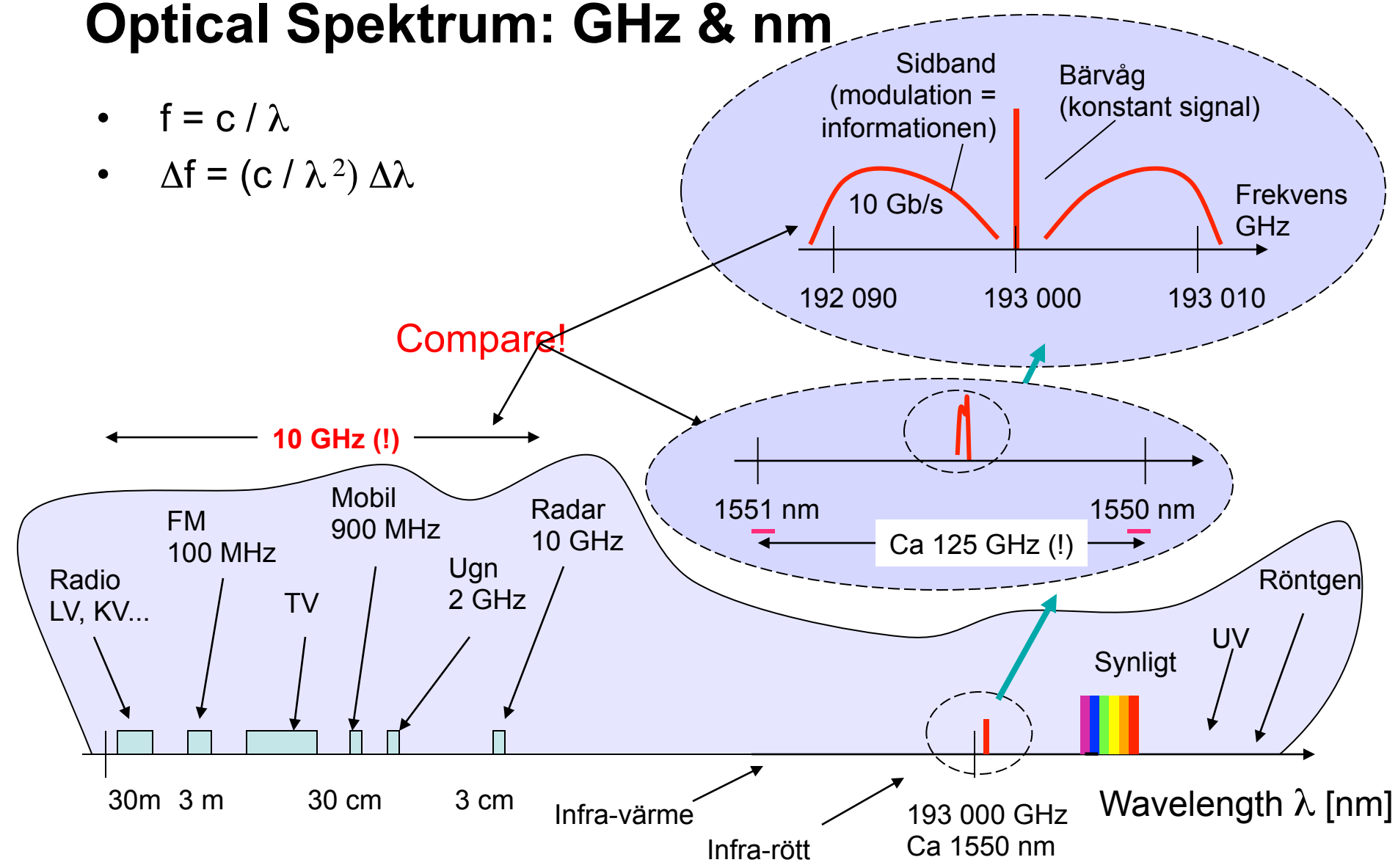
14 Tb/s, 140 ch x 111 Gb/s over 160 km fiber

NTT in PDP at ECOC 2006



Optical Spektrum: GHz & nm

- $f = c / \lambda$
- $\Delta f = (c / \lambda^2) \Delta\lambda$



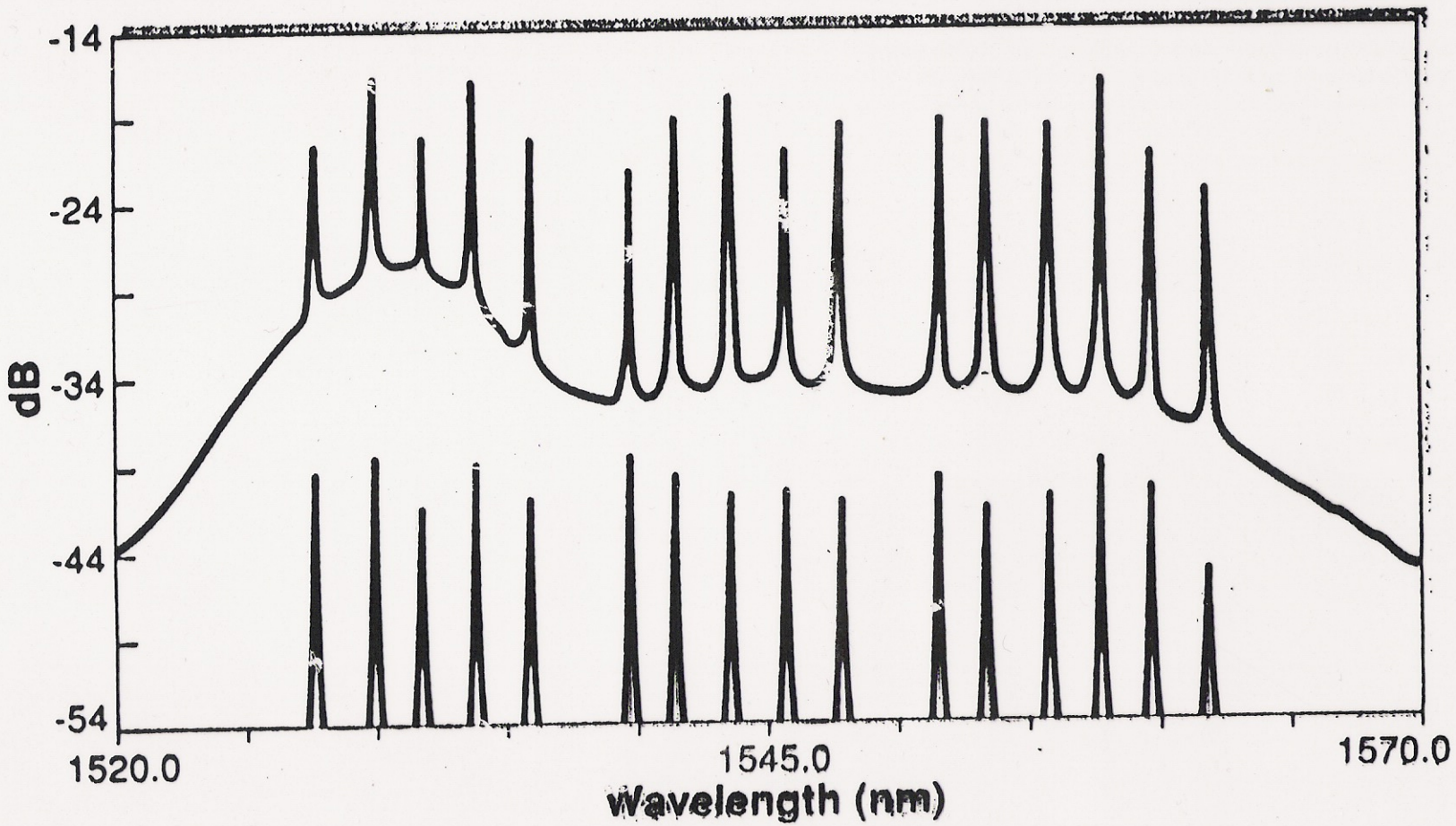


FIGURE 4. Spectra show 16 DFB lasers before (bottom) and after (top) the OFA in Bellcore's HD WDM broadband distribution experiment. The entire OFA bandwidth was used.

100 Gbps transmission

Requirement: the 100G solution (TDM)
needs to be more cost-effective
than 10 separate 10G wavelengths (WDM)
providing a lower cost per transmitted Gigabit

The challenges posed by 100G compared to 10G transmission

- Loss of 10 dB of signal margin
- Chromatic dispersion increases
- Sensitivity to polarization mode dispersion increases
- Signals have higher spectral occupancy

100G is possible using: DP-QPSK
Dual Polarization Quadrature Phase Shift Keying modulation with a coherent receiver

Dual Pol QPSK modulation lowers the baud rate to 25 Gbps, using four bits per symbol

A coherent receiver operates by mixing a local oscillator and the incoming signal

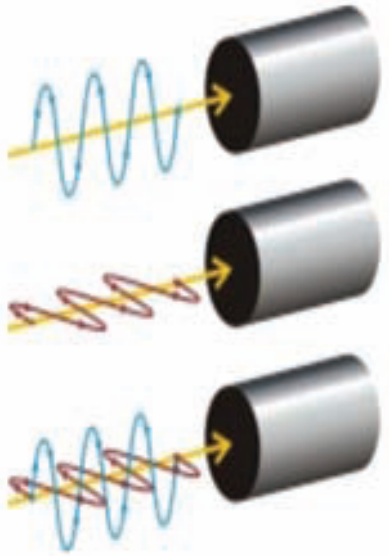
The coherent receiver is able to lock into the frequency and phase of the incoming signal

The coherent receiver allows for a linear response in detecting the electric field, compared to the square law response of conventional photo detectors

Vertical Polarization (V)

Horizontal Polarization (H)

Dual Polarization



Four combinations of 0, 1, V, H:
00, 01, 10, 11
i. e. four bits per symbol